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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,000	07/03/2003	Young Ho Kim	123056-05004464	3369
43569	7590	10/21/2005		
MAYER, BROWN, ROWE & MAW LLP 1909 K STREET, N.W. WASHINGTON, DC 20006			EXAMINER WALTER, CRAIG E	
			ART UNIT	PAPER NUMBER
			2188	

DATE MAILED: 10/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/612,000	KIM ET AL.	
	Examiner	Art Unit	
	Craig E. Walter	2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08/22/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) 4-6 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 July 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>7/3/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

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Election/Restrictions

1. Applicant's election with traverse of Group I in the reply filed on 8/22/2005 is acknowledged. The traversal is on the ground(s) that the three groupings are closely related to each other and define a single invention, and therefore not unduly burdensome for the Examiner to examine the claims of all three groups. This is not found persuasive because Applicant's general allegations fail to provide specific evidence to the contrary of the Examiner's initial assertion that each of the three groups define a separate utility, therefore each requiring a unique search.

The requirement is still deemed proper and is therefore made FINAL.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The information disclosure statement (IDS) filed on 7/3/2003 was received and fully considered by the Examiner.

Specification

4. The disclosure is objected to because of the following informalities:

The abstract of the disclosure is objected to because it exceeds the maximum length of 150 words. Correction is required. See MPEP § 608.01(b).

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-3 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As for claim 1, it is unclear how the claimed original and snapshot mapping tables are stored in a disk "*at a layout of a disk configuring a logical volume*" as described in line three of this claim. The claim will be further treated on its merits based on the presumption that the mapping tables are stored within a logical volume of said disk.

Claims 2-3 are rejected as they inherit the limitations of claim 1.

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-3 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As for claim 1, the adjective "large" used to describe the "network storage" in line two of this claim renders the claim indefinite as the specification fails to provide any standard for ascertaining the requisite degree to which "large" limits the scope of the claimed invention. The network storage as recited in claim 1 will be further be treated as any network storage without size limitation.

Claims 2-3 are rejected as they inherit the limitations of claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lubbers et al. (hereinafter Lubbers) US Patent 6,915,397 B2 in further view of Grummon et al. (hereinafter Grummon) US Patent 6,341,341 B1.

As for claim 1, Lubbers teaches a system based on a storage array network (SAN), in which a plurality of hosts (Fig. 1, elements 105-107, 109) share a large network storage (Fig 1, element 101 – storage pool) – Col. 6, lines 53-63, wherein an original mapping table is stored in the same disk at a layout of a disk configuring a logical volume in the network storage. Referring to Fig. 1, the storage pool (101) is divided into LDADs (i.e. 103), which are further divided into logical disks – Col. 9, lines 20-30. Further, a mapping structure (i.e. original mapping table) is stored in the memory of the logical disks that enables the translation of LBAs to physical disk locations (col. 10, line 66 through col. 11, line 12).

Lubbers however does not teach storing a snapshot mapping table on the same disk, nor does he teach adding a snapshot volume, and allocating a data block in the same disk if a copy-on-write (COW) operation is carried out as claimed by applicant.

Grummon however teaches a system for enabling a snapshot container generated in a copy-on-write backup process. In his disclosure, Grummon describes creating a snapshot container (i.e. snapshot volume) in response to performing the copy-on-write procedure, which reads from and writes to a read-write container (col. 5, lines 55-60). This snapshotted volume (Fig. 2, element 206) will then receive mapped data from the system (hence inherently data blocks must be allocated to receive the newly mapped data). Grummon further teaches his system as maintaining a modified bit table (Fig. 3, element 314),

which is stored within the same I/O system as the snapshot container and the read-write container. The modified bit table stores a bit map (element 330 of Fig. 3) which contains information on which block has been modified, hence enabling the system to recognize which data will need to be snapshot during a subsequent copy-on-write operation (col. 7, lines 25-35). This modified bit table enables the system to track the snapshot table, hence functioning as the snapshot table as claimed by Applicant.

It would have been obvious to one of ordinary skill in the art at the time of the invention for Lubbers to further include Grummon's system for enabling a snapshot container generated in a copy-on-write backup process to his system for generating a point in time storage copy. By adding the components of Grummon's I/O subsystem (i.e. the snapshot container, snapshot mapping table, and read-write snapshot container) to a logical disk, Lubbers system would benefit by exploiting Grummon's system of employing a copy-on-write back system utilizing read-write snapshot containers, which would in fact increase the system compatibility with standard file systems (as described in Col. 4, lines 2-17) and broaden the applications of which Lubbers' may put his system to use (i.e. database environments as described in col. 4, lines 19-23).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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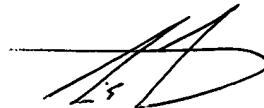
Humlicek et al. (US Patent 6,594,744 B1) disclose managing a snapshot volume with multiple point-in-time images in a single repository.

Brown et al. (Us Patent 6,101,585) disclose a mechanism for incremental back up of on-line files.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig E. Walter whose telephone number is (571) 272-8154. The examiner can normally be reached on 8:30a - 5:00p M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on (571) 272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Craig E Walter
Examiner
Art Unit 2188

CEW


10/13/05
MANO PADMANABHAN
SUPERVISORY PATENT EXAMINER